

SOUTHERN UTAH FUEL COMPANY

RESOURCE RECOVERY  
AND  
PROTECTION PLAN

QUITCHUPAH LEASE  
FEDERAL LEASE:  
U-63214

Coastal States Energy Company  
September 1989

File in:

☐ Confidential

☐ Shelf

☒ Expandable

Refer to Record No.

Date

In C/ 0410002

For additional information

2  
09/11/989

Incoming

## TABLE OF CONTENTS

	PAGE
LIST OF TABLES.....	1
LIST OF EXHIBITS.....	2
INTRODUCTION.....	3
STATEMENT OF CONFIDENTIALITY.....	4
PREVIOUS RESOURCE RECOVERY AND PROTECTION PLANS.....	5
RESERVE BASE.....	6

## LIST OF TABLES

### TABLE

### PAGE

I	Resource Recovery and Protection Plan Reserve Base for Quitichupah Lease U-63214	8
---	---	---

LIST OF EXHIBITS

Exhibit I

Upper Hiawatha Coal Seam Isopach Map on Mine Plan Base  
Scale 1"=1000'

Exhibit II

Lower Hiawatha Coal Seam Isopach Map on Mine Plan Base  
Scale 1"=1000'

Map 4.1

Underground Mine Plan Upper Hiawatha  
Scale 1"=1000'

Map 4.2

Underground Mine Plan Lower Hiawatha  
Scale 1"=1000'

## INTRODUCTION

This Resource Recovery and Protection Plan is submitted as an addendum to Coastal States Energy Company's 1983 Resource Recovery and Protection Plan for the coal reserves mined by its subsidiary, Southern Utah Fuel Company. This addendum is for the reserves contained in the Quitchupah Lease U-63214. This coal lease was successfully acquired by Coastal States Energy Company on June 16, 1989 as the result of a competitive lease sale held by the Bureau of Land Management. The Quitchupah Lease will be mined in conjunction with Coastal's other adjoining leases. The mine life plans show mining not only on the Quitchupah Lease but on other leases as well. Reserves in this report are limited to the Quitchupah Lease. The 1983 Resource Recovery and Protection Plan details the reserve base for the adjoining leases.

#### STATEMENT OF CONFIDENTIALITY

All enclosed geologic data, maps, reserve calculations, and geologic interpretations are proprietary and confidential. This report discloses geologic trends which could be used by competitors to estimate mining costs and as-mined coal quality for the duration of mining. Interpretations herein are developed with proprietary computer software and geologic studies and contribute to Coastal's regional assessment of coal lands including non-Federal tracts.

## RESERVE BASE

The reserve base for the Quitchupah Lease U-63214 is based on geologic information available to Coastal as of July 31, 1989. Drill hole information as well as in-mine information from the adjacent Southern Utah Fuel Company Mine No. 1 (SUFCo Mine) was used to develop isopachs for the coal seams. Property boundaries for the lease are based on the legal description of Lease U-63214 and the U.S.G.S. quadrangle maps of the area. Total lease acreage using this method is 9,905.46 acres.

### Mining Projections

Mine plans for both the Upper Hiawatha and Lower Hiawatha coal seams are shown on Maps 4.1 and 4.2 respectively. Sequencing is shown by year for the first five years of mining in conjunction with Coastal's existing adjacent leases and then in 5 year increments through depletion of the reserves. The R2P2 submitted by Coastal in 1983 details the reserves on the adjacent leases (see section entitled Previous Submitted Resource Recovery and Protection Plan Submitted).

### Reserve Base Criteria

Reserves are categorized as in-place, mineable, and recoverable. Reserves 48 inches or more in thickness are included in the in-place reserve base. Mineable reserves are in-part based on equipment limitations. Recoverable reserves are based on historical recovery rates attained in the adjacent SUFCo Mine.

The minimum feasible mining height is 5 feet. The maximum mining height used is dependent upon the type of extraction method. For main and submain entry systems, the general criteria is full seam height up to a 9 foot maximum mining height. For second mining (pillar recovery) panels, the maximum average mining height is taken as 10.5 feet. In areas with less than 10 feet of seam height, the total seam height is assumed to be mined. For first mining (partial extraction) panels, the maximum mining height is assumed to be 2 feet less than the seam height in areas of at least 10 feet seam height. The mining height in first mining areas with less than 10 feet of coal is the seam height. Mining height for longwall panels is assumed to be two feet less than the seam height for seam heights greater than 10 feet up to a maximum mining height of 13.0 feet. The mining height is assumed to be one foot less than the seam height for seam heights between 8 and 10 feet. For seam heights between 7 and 8 feet full recovery of the seam is expected. If the seam height is less than 7 feet, longwall mining methods are not used. The mining height criteria detailed above is based on operating history at the adjacent SUFCo Mine.

The mineability of the Lower Hiawatha coal seam is dictated in part by its close vertical proximity to the Upper Hiawatha coal

seam. Only areas with greater than 30 feet of interburden between the two seams are considered mineable.

#### Recovery Factor Criteria

Historical recovery rates at the adjacent SUFCo Mine as well as projected recovery rates are utilized in the recoverable reserves determination. Second mining is assumed to recover 75% of the mineable reserves. First mining should yield 50% of the mineable reserves. In those areas where main entry pillars can be recovered, 50% of the mineable reserve is assumed to be recovered. No barrier recovery is assumed when pillars are recovered in the mains. Those mains that are driven through non-subsidence areas are assumed to have a recovery of 29-34% of the mineable reserve depending on the amount of overburden and the number of entries. Longwall mining areas are assumed to recover 83% of the mineable reserves.

#### Reserve Calculations

The reserve calculations are based on the coal seam isopach maps included as proprietary Exhibits I and II and the mine maps Map 4.1 and Map 4.2. These maps were prepared at a 1"=1000' scale.

The reserves were measured by planimetering each individual area of the isopach map bounded by the isopachs and mine plan layout lines. The data was recorded on data sheets by mining type, seam height and recovery factor. These data were then entered into an in-house computer routine where the reserves were calculated using the criteria discussed above to the nearest 100 tons. A coal density of 1,800 tons per acre foot was utilized in calculating the reserve base.

#### Reserve Base

The reserve base information is broken down by coal seam for the Quitchupah Lease in Table I. Reserve tonnages are shown rounded to the nearest thousand tons. The weighted average seam height (based on in-place reserves), mining height (based on mineable reserves), and recovery (ratio of recoverable to mineable reserves) are also shown in Table I. The Quitchupah Lease U-63214 reserve calculations have yielded an estimated in-place reserve base of 144,024,000 tons. Mineable reserves are estimated at 121,575,000 tons. The recoverable reserves for the Quitchupah Lease are estimated at 85,615,000 tons. The Upper Hiawatha coal seam is estimated to contain an in-place reserve of 122,141,000 tons. Mineable reserves for the Upper Hiawatha coal seam are estimated at 103,384,000 tons. The recoverable reserves for the Upper Hiawatha are estimated at 73,089,000 tons. The Lower Hiawatha coal seam is estimated to contain an in-place reserve of 21,883,000 tons. The Lower Hiawatha mineable and recoverable reserves are estimated to be 18,191,000 tons and 12,526,000 tons respectively.



TABLE I  
RESOURCE RECOVERY AND PROTECTION PLAN  
RESERVE BASE FOR QUITCHUPAH LEASE  
U-63214

SEAM	AVERAGE SEAM HEIGHT (FEET)	AVERAGE MINING HGT. FEET	AVERAGE RECOVERY (%)	IN-PLACE (TONS)	RESERVE BASE MINEABLE (TONS)	RECOVERABLE (TONS)
Upper Hiawatha	12.5	10.4	71	122,141,000	103,384,000	73,089,000
Lower Hiawatha	9.6	8.5	69	21,883,000	18,191,000	12,526,000
	=====	=====	=====	=====	=====	=====
TOTAL	12.1	10.1	70	144,024,000	121,575,000	85,615,000

## PREVIOUS RESOURCE RECOVERY AND PROTECTION PLAN SUBMITTALS

Coastal States Energy Company submitted a Resource Recovery and Protection Plan to the Bureau of Land Management in April 1983 for the following leases:

SL-062583

U-062453

U-0149084

U-28297

U-47080

Fee.

The methods of reserve calculation used in this plan are basically the same as those used in the 1983 Plan.

The 1983 Resource Recovery and Protection Plan contains a cross reference to submittals made earlier under the old 30 CFR 211 Regulations.

A Mining and Reclamation Plan (MRP) entitled "Quitichupah Lease Addition Coal Lease U-63214" was submitted to the regulatory authority in June 1989. This MRP describes the mining plan, the impact the mining activity will have on the environment, mitigation measures and monitoring procedures.